

ABSTRACT

Mammalian oocytes undergoing meiotic maturation are transcriptionally silent and gene expression is therefore regulated at the level of translation. One of the well established mechanisms employed in translational regulation of maternal mRNAs in oocytes is cytoplasmic polyadenylation. This process is generally controlled by phosphorylation and activation of cytoplasmic polyadenylation element binding protein (CPEB). The aim of this thesis is to determine the role of mitogen-activated protein kinase (MAPK) in regulation of CPEB-mediated cytoplasmic polyadenylation in maturing mouse and porcine oocytes. For this purpose, MAPK activity was inhibited using its specific inhibitor, GDC-0994 and the effect of MAPK inhibition on cyclin B1 mRNA polyadenylation was monitored. In mouse oocytes, MAPK inhibition impaired neither cyclin B1 mRNA polyadenylation nor its translation and MAPK is thus unlikely to be involved in regulation of cytoplasmic polyadenylation in this species. Based on the results of experiments performed using porcine oocytes, the possible role of MAPK in CPEB-mediated cytoplasmic polyadenylation can neither be confirmed nor ruled out.

Keywords: cytoplasmic polyadenylation, mouse oocyte, porcine oocyte, mitogen-activated protein kinase (MAPK), cyclin B1, GDC-0994 inhibitor